GAS JOURNAL, MAY 14, 1941

VOL. 234 93rd YEAR No. 4069

EDITORIAL NOTES

COKE

IT is now nearly a year since the Secretary for Mines urged upon all consumers—industries, public utilities, and householders—the desirability of stocking coke for the winter of 1940–41. We know that gas undertakings generally gave their full support to the appeal; they did all that was practicable, acting in co-operation. Fortunately—very fortunately indeed—machinery existed whereby plans for the most economical distribution of the supplies available could be speedily formulated and the Industry acted in full concert with the Ministry of Mines. Such matters as transport costs of coke from one area to another and the incidence of such costs on the price of coke to the consumer were dealt with in an admirable way, and we got through the winter, in the circumstances, fairly smoothly.

The need remains for continued effort, reinforced endeavour, to replenish as far as practicable stocks depleted by winter demand and the growing requirements of the Government of coke for war purposes. We have said that gas undertakings made excellent co-operative response and pulled together in the common aim. As far as possible transport difficulties were overcome. Transport is still a key problem in the general situation, and ample supplies of coke necessarily depend on adequate supplies—this is more than ever vital under wartime conditions—of coal. If some gas undertakings are not too happy about either their coal stocks or their coal supplies (and we have reason to think that in certain areas this is the case) the reason, we believe, lies in transport problems. We are, of course, cognizant of the heavy wartime demands made upon the railways, and we are aware of the great work which has been, and is being, done by the railways. But coal supplies to public utility undertakings are of the utmost importance in the prosecution of the war, and now that the hours of blackout are so few, perhaps more could be accomplished by speedier loading and unloading of wagons, by still more effective co-operation between Transport and the Gas Industry, still closer understanding of the problems involved. Also the possibilities should be explored of relieving transport by greater use of coke manufactured locally.

OUT OF THE LIMELIGHT

THE British Commercial Gas Association does not benefit these days by its skilful and, in peacetime, its highly entertaining publicity on behalf of the Gas Industry—which means to say that the Gas Industry is not for the time being helped by B.C.G.A. national publicity. Its abandonment during the war was voluntary; no doubt majority sentiment was in favour of its temporary cessation, but there are some in the Industry who have always held the opinion that information of its activities addressed to the public through the National Press would have been appreciated by them, that they would have been glad to hear of its organization to combat and overcome wartime difficulties and to give them a service which, if on occasion it fails from the effects of bombing, is practically continuous. Failures are remedied with, considering the conditions, commendable and often quite amazing rapidity. We are thinking of informative messages such as those adopted by the British Railways, not of crude propaganda designed in purely competitive vein. We have often wondered whether the Industry has not a duty imposed upon it by the fact that it is a great national public utility to explain to the community how it is carrying out its obligations and what exactly its aims are. Why, we have asked ourselves, keep the public in the dark?

It would, of course, be wholly false to assume that the British Commercial Gas Association is inactive or is sleeping lightly. Far from it. The staff is grievously depleted, but to our mind B.C.G.A. efforts, as it were "behind the scenes," are doing a great deal for a National Industry on behalf of national war effort. Already its liaison with Government Departments has been extraordinarily effective. It has co-operated, and continues to co-operate, wholeheartedly with the Ministry of Food, with the Ministry of Information. From the source it radiates its suggestions to member undertakings on how best to further Government aims in the conservation of food, on appetizing and nourishing ways of preparing it—and so on.

Let us take a few instances of what the B.C.G.A. is doing this month. Edited by Mr. C. H. Middleton and issued with the approval of the Ministry of Food comes the first of a series of pocket-size leaflets on vegetable growing and cooking. Each leaflet deals with two months' planting and work in the vegetable garden; each leaflet includes recipes for cooking vegetables in season. The series has been planned by the B.C.G.A., for the Gas Industry, as part of its support of the national "Kitchen Front" campaign. Then there is a revised edition of the leaflet "Jam Making and Bottling," issued with the approval of the Ministry of Agriculture—a leaflet which should be of assistance to individual housewives and all women's organizations. Last Saturday the Ministry of Information window display recommenced, following on the lines on which it was run last year, each display dealing with a theme of outstanding importance to the war effort. The material for the displays is provided by the Ministry through the Association. Advice is being given on subjects ranging from war weapon-week links-up to potato bar equipment and service. The Association, then, may be outside the public limelight; it is certainly working efficiently and effectively in a particular and necessary sphere of the Gas Industry's war effort—that of aiding Government Departments by placing at their disposal the facilities of widespread showrooms and demonstration theatres and the assistance of trained and keen staff.

Financial Hardships in War

Some interesting events which had occurred during the life of the Special Purposes Section of the North of England Gas Managers' Association were mentioned by Mr. T. P. Ridley when a presentation was recently made to him by the Section, further reference to which will be found in our Personal column this week.

First of all, during the last War, it was the North of England Section which first brought to London's notice the question of Financial Hardships. They had collected information from all over the country on the subject and had had it tabulated. The result was that nine Bills were brought into Parliament which were all referred to one Committee and a verdict was given on the whole lot. Out of this there eventually came the Gas Undertakings Act, 1920. In the same year the South Metropolitan Gas Company introduced a Bill for minimum dividends; other undertakings followed suit and the result was much to the advantage of the Industry.

The North, said Mr. Ridley, could also claim credit for a deputation urging that tariffs might be introduced, a direct result of which was that the Wrottesley Committee was set up. There emanated from that Committee the Gas Undertakings Act, 1934, which gave to the Industry the option to put up tariffs.

A noteworthy fact brought out in the course of the Presentation was that there had been only two Chairmen of the Section since its formation in 1910—the late Mr. Waddom, and the present Chairman, Mr. Herbert Lees.

Personal

A presentation was recently made by the Special Purposes Section of the North of England Gas Managers' Association to Mr. T. P. RIDLEY. Before making the presentation, Mr. Herbert Lees, Chairman, said that it was not easy to express either in words or by a token the full appreciation of the services which Mr. Ridley had given to the Gas Industry. He recalled that he had himself been a member of the Section from the very beginning in 1910, and he thought that Mr. Ridley came very near to that too, for he had been associated with it practically ever since its inception, and as far as the Section was concerned he had made very considerable contributions to its proceedings. Speeches were also made by Mr. J. R. Bradshaw and Mr. E. Crowther.

The Chairman then announced that it was proposed to elect Mr. Ridley an Honorary Member of the North of England Gas Managers' Association, and presented him with a gold watch on which was inscribed, "Presented to T. P. Ridley, Esq., F.C.I.S., by the Special Purposes Section of the North of England Gas Managers' Association, in appreciation of his valuable services to the Gas Industry and of his friendship."

Awards for Gallantry

Recent supplements to *The London Gazette* contained a number of names of officers and employees of gas undertakings in various parts of the country whose gallant conduct in the face of enemy action has received recognition.

M.B.E.

W. A. Barnett, M.I.Mech.E., Engineer and Manager, Mid-Kent Gas Light and Coke Company.

J. Carr, Chief Officer A.R.P. Services, Stretford and District Gas Board.

George Medal

G. J. Ditch, purifier attendant, Gas Light and Coke Company.

G. D. Jones, gasholder attendant, Bristol Gas Company.

H. Lee, roof spotter, Leeds City Gas Undertaking.

F. J. May, resident works foreman, Mid-Kent Gas Light and Coke Company.

A. Webb, gas stoker, Gas Light and Coke Company.

British Empire Medal

S. E. Bendall, foreman, Gas Light and Coke Company.

J. A. Benn, gas stoker, Gas Light and Coke Company.

A. Brady, foreman, Bristol Gas Company.

A. E. H. Carter, assistant valveman, Gas Light and Coke Company.

W. Harman, charge hand, Gas Light and Coke Company.

R. Johnston, foreman gasfitter, Gas Light and Coke Company.

E. Lawrence, carbonizing foreman, Gas Light and Coke Company.

E. W. Meadowcroft, power house attendant, Gas Light and Coke Company.

H. Oliver, purification foreman, Gas Light and Coke Company.

H. J. A. Pearce, relief carbonizing foreman, Gas Light and Coke Company.

G. E. W. Pearce, carbonizing foreman, Gas Light and Coke Company.

J. J. Woodley, valveman, Gas Light and Coke Company.

Commendations

Gas Light and Coke Company: G. F. Bond, R. H. N. Cassells, G. Cockerill, W. R. Eddings, F. Gibbs, C. G. Gunner, E. J. Jacobs, M. A. Page, E. A. Plummer, P. J. Polley, H. J. Price, A. Rickman, C. Risby, H. Scribens, G. H. Sharp, C. J. Stockley, A. J. Swann, D. Trotter, H. C. Wells.

Mid-Kent Gas Light and Coke Company: J. H. Cogger, J. J. Lavender.

Bristol Gas Company: H. C. Stone.

Obituary

P. C. Holmes Hunt

The death has occurred in Sydney on May 6—suddenly while going about his ordinary work—of Mr. P. C. HOLMES HUNT, M.Inst.C.E., F.I.C. He was well known in Gas Industry circles in this country, which he visited from time to time.

In Australia he was a leader of the Industry and was first President of the National Gas Association of Australia in 1937. For many years previous to that he was Chairman of the Gas Companies' Association of Australia.

Mr. Hunt went to Australia as Assistant Engineer to the Metropolitan Gas Company of Melbourne. After being Engineer for several years he left the service of the Company to become Chairman and Managing Director of the Colonial Gas Association, and took up consulting work. For over 20 years he was Consultant to the leading Gas Undertakings in Sydney, Newcastle, Adelaide, and Hobart. Mr. Holmes Hunt's activities, however, were not confined to the Gas Industry; he was Chairman of the Mount Lyell Mining and Railway Company, a large, and the only, copper-producing mine in Australia, which has also large interests in several superphosphate and chemical companies.

An Appreciation by B. R. Parkinson

It came indeed as a shock; the cable read, "Deeply regret Holmes Hunt died suddenly this morning." One of those inscrutable dispensations of Providence which baffle the wisdom of man; we felt the same when Arthur Duckham was taken; virile personalities whom it would seem the world can ill afford to lose.

I knew Philip Hunt (P.C.H.H. as he always figured in my diaries) in early days of pupilage. We were together at Windsor Street Gas-Works, Birmingham, under his father, who was one of the leading gas engineers of the period. Memory lingers in the works and laboratory, and at my rooms where he brought his songs for accompaniment, but most vividly in the hospitable home of his parents. Mr. Charles Hunt (Sen.) came originally from Norfolk to London at the invitation of my father, who introduced him to the Gas Industry, and married an Australian lady whose gracious personality so warmly enriched the home at Gravelly Hill. Her name was perpetuated as a prefix to the surname of her children. There were three sons, two of whom became connected with the Gas Industry, and two daughters, who gave their names to the famous twin gasholders at Windsor Street Gas-Works. Philip, the eldest son, came into the profession like a whirlwind; a little irresponsible at first, but, having boundless ambition, he soon settled down to serious progress. Not many years elapsed, during which he passed through all the stages of experience in the Birmingham Gas Department, before the offer came for him to go to Melbourne as Engineer to the Metropolitan Gas Company. That was early promotion for a young man, but he had gifts of personality and leadership which soon brought him to the forefront of the Industry in the land of his mother and of his adoption. He also inherited from his father a mind of shrewd and balanced judgment, based on a special facility for weighing evidence.

Like his father, and in common with his family, loyalty was one of the outstanding characteristics of P. C. Holmes Hunt.

* * *

Judge A. DOBIE, who latterly had held the position of Convener of Dumfries Town Council Gas Committee, has died in his 72nd year.

* * *

The death took place at Musselburgh on May 6 of Mr. WILLIAM THOMSON, late Manager of the Musselburgh Gas Company.

* * *

Mr. JOHN WILLIAM HORWILL, Commercial Superintendent to the Bradford Corporation Gas Department and one of the leading personalities in the Yorkshire Junior Gas Association for most of its history, died suddenly on May 5 at his home at Heaton, aged 57. He had been Hon. Secretary and later President of the Yorkshire Junior Gas Association, and was an ex-Chairman of the Bradford Branch of the N.A.L.G.O. He was associated also with the West Riding Gas Salesmen's Circle, Bradford Rotary Club, and Shipley Rotary Club.

* * *

The death occurred at the Molesey Cottage Hospital on May 4 of Mr. ERNEST WILLIAM GILBERT. He was 71 years of age and had been ill for five weeks. Mr. Gilbert served for 50 years in the stores department of the South Metropolitan Gas Company, from which position he retired six years ago. During the Boer War and also during the Great War of 1914–1918 he was Hon. Secretary of the Officers' and Employees' War Fund, and the administration of the fund involved the writing of many thousands of letters to men in the fighting forces.

The Ninth Meeting of the Arthur Duckham Memorial Fund Committee will take place at 1, Grosvenor Place, London, S.W. 1, on May 27 at 2 p.m.

The Board of Directors of the Imperial Continental Gas Association announce that they are unable to recommend payment of a dividend for the year ended March 31, 1941, on the £5,600,000 Capital Stock of the Association.

Middlesbrough Gas and Electricity Committee has decided to reduce the price of gas for central heating by 2d. per 1,000 cu.ft. after the consumption of the first 20,000 cu.ft. per quarter. The Gas Engineer (Mr. J. W. Pallister) has been instructed to review gas charges generally.

Copies of the following recently issued British Standard Specification can be obtained on application to the Secretary, The Institution of Gas Engineers, 1, Grosvenor Place, London, S.W. 1, price 2s. 3d. each, post free: No. 950—1941. Artificial Daylight Fittings for Colour Matching.

Birkenhead Corporation Gas Committee has recommended a reduction in the price of gas to 2s. 6d. per 1,000 cu.ft. on the extra consumption to persons who have had to use increased quantities of gas for lighting because the windows have been boarded up after bombing.

Under Authority granted by the Board of Trade, in terms of Paisley Gas (Relaxation of Notice) Order, dated April 17, 1941, Paisley Corporation give notice that, as from May 16, 1941, the declared calorific value of gas supplied within the Paisley area will be reduced from 450 B.Th.U. to 425 B.Th.U. per cu.ft. The price of gas per therm will remain unchanged until further notice.

North of England Gas Managers' Association

The Annual Meeting of the Association was held at the County Hotel, Newcastle, on May 2, under the Presidency of Mr. H. P. Allison (Redcar). The Minutes of the last Meeting of the Association were confirmed and the following new members and associate members were elected: A. L. Higham, Engineer, British Gas Light Company, Hull; C. Brooks, Manager, Alston; J. Gow, Newcastle; T. Tait, Newcastle.

The Annual Statement of Accounts was presented and adopted. The election of Mr. T. P. Ridley, F.C.I.S., as an Honorary Member was unanimously agreed.

The following recommendations of the Committee were then considered and adopted unanimously:

(*a*) That a donation of £10 10s. be granted to The Institution of Gas Engineers.

(*b*) That Mr. J. W. Pallister (Middlesbrough) be appointed the Association's District Member on the Council of The Institution of Gas Engineers.

(*c*) That Mr. N. Reid (Gateshead) be elected a member of the Educational Advisory Committee.

(*d*) That Messrs. E. Crowther, R. H. Duxbury, J. M. A. Mitchell, and A. E. Ruffhead be elected representatives on the District Education Committee.

Officers for the ensuing year were elected as follows:

President: S. A. Wikner (Newcastle).
Vice-President: W. Tunmore (Bishop Auckland).
Committee: A. G. I. Anderson (Shotley Bridge), J. M. A. Mitchell (Newcastle), F. L. Scaife (Stockton-on-Tees).
Hon. Secretary and Treasurer: H. Douglas Lees (Hexham).
Hon. Auditor: C. C. Walmsley (Sunderland).

Reserved Occupations and Protected Work

The Institution of Gas Engineers has been informed by the Ministry of Labour and National Service that the Minister has decided that the continued reservation of student engineering apprentices reserved under the Schedule of Reserved Occupations and Protected Work will be dependent upon the Ministry receiving periodical confirmation that the student is making satisfactory progress in his studies. With this end in view the local offices of the Ministry will shortly issue to every reserved student a letter warning him of the conditions for the continuation of his reservation.

To secure the required confirmation it has been decided that the appropriate local offices of the Ministry will, during the first week in June and December, send to the head of the training establishment at which a reserved student is studying a letter asking him to arrange for the completion of an appropriate certificate. It is anticipated, however, that some of the students, particularly student engineering apprentices, will not be studying at a recognized college, and in such cases the professional institution for whose examination the man is studying will be asked to complete the necessary certificate.

Those studying for the Higher Grade Examination in Gas Engineering (Manufacture) or (Supply) who are not following an approved course in gas engineering at a technical college and who wish to obtain the necessary certificate of satisfactory progress should write, giving full particulars of their course of study, to the Secretary of the Institution.

In the Schedule of Reserved Occupations and Protected Work (Revision April 10), Part III, Section 2(b), special arrangements are announced for men under 25 with certain qualifications and certain classes of students. Under these regulations men under the age of 25, belonging to specified classes, may make application to University Joint Recruiting Boards. The Boards may recommend that such men should engage in technical service in the Forces, or in scientific or technical work of a civilian character, or that they should complete a course of study so as to be better fitted for such service.

The Institution, we learn, has been informed by the Ministry of Labour and National Service that the scope of the terms of reference of the University Joint Recruiting Boards includes the Higher Grade Certificate in Gas Engineering (Manufacture) or (Supply). The Institution has been informed that a student studying for the Higher Grade Certificate in Gas Engineering will only be eligible to go before a Joint Recruiting Board if he has passed the Ordinary Grade Examination in Gas Engineering and is not otherwise reserved, for example, as a Student Engineering Apprentice.

Gas Pokers and the National Salvage Effort

Hundreds of gas pokers per week have been sold by the Newcastle and Gateshead Gas Company since the early part of this year. The Company were approached by the local salvage officer to assist in the national effort for increasing the salvage returns of wood and paper in the district. For this purpose, special window displays were arranged displaying gas pokers. One of these entitled the "Light Brigade," with the necessary showcards displaying a platoon of Pokers marching with small Union Jacks flying, created considerable attention. Dealer sales are still further adding to the total, as the Company have contacted certain large retail stores, and these readily agreed to display and sell gas pokers.

London and Southern District Junior Gas Association

The Annual General Business Meeting will be held on Friday, May 23, at 7 p.m., at the Westminster Technical Institute, Vincent Square, S.W. 1.

At the conclusion of the Business Meeting, Mr. T. S. Rickets, of Hertford, will give a summary of his Paper entitled "Gas and Steam Loads on Small Works," which was published in the "JOURNAL" of Feb. 26 and March 19.

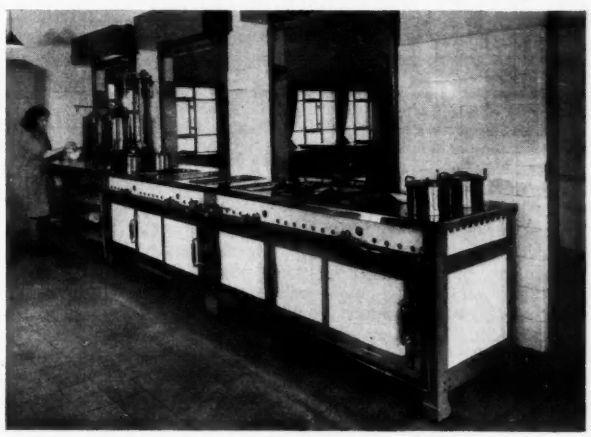
A discussion of the Paper will take place, which will not be published in the Technical Press.

The Council have decided to recommend to members that in view of the continued present state of emergency, the President, the Senior Vice-President, and the Junior Vice-President should retain their offices for the Session 1941–42.

A Fine Canteen Installation

Odhams Ltd. have one of the largest and most up-to-date printing and publishing works in the country, in which modern fast-running presses each regularly turn out the various periodicals issued by the Company at the rate of 35,000 copies per hour, printed in four colours simultaneously, all stitched, folded and counted ready for the newsagent.

For the large staff of workers employed, the firm has had installed recently, through the Watford and St. Albans Gas Company, a



canteen laid out and equipped to the very latest standards, the whole of the apparatus for which was supplied by Radiation Ltd.

The following appliances were included, all in "Radar" porcelain enamel finish: One No. 617 "Chester" range ; hotplate fitted with 5 large and 10 small ring burners. One No. N.K.2 steamer. One double pan "Causeway" fish fryer. One 20-gallon "Lune" boiler. One No. 27 "Savoy" griller on stand. One service counter 22 ft. long by 2 ft. 3 in. deep by 2 ft. 10 in. high with stainless steel top and utensils. One "Hobart" L.F.2C steam heated dish washing machine in stainless steel finish; complete with stainless steel tabling. One No. 5M "Hobart" potato peeler with electric motor. One central glass hood measuring 9 ft. by 6 ft. by 2 ft. 6 in. high. The canteen is fully equipped to provide hot meals for 400 persons.

FURNACE INSULATION

[Contributed]

THE conservation of the heat supplied to a furnace and the directing of that heat to the position at which it will be most usefully applied presents one of the most difficult problems in furnace design. Many furnace builders are inclined to neglect insulation or, at the most, treat it as of secondary importance unless the furnace is likely to be in constant operation. The chief objection seems to be fear of increased first cost, though the more reasonable view would be that of eventual reduction in running costs.

Provided a suitable material is chosen and correctly incorporated in or around the structure the added cost can always be justified, even in furnaces used for work which entails frequent rebuilding and consequent disturbance of brickwork and insulation. Indeed, the frequence of rebuilding may be somewhat modified by the fact that insulation will reduce the actual heat input required for carrying out the work, and thereby increase the life of the refractories.

The heat transmission through the refractories forming the crown, floor, and walls of a furnace may represent anything up to 50% of the total heat losses. Assuming a furnace has a thermal efficiency of 40%, with a gas input of 250,000 B.Th.U. per hour, the total heat loss through flues, brickwork, &c., is 150,000 B.Th.U. per hour. Since good insulation can save at least 50% of the heat loss through brickwork it follows that in

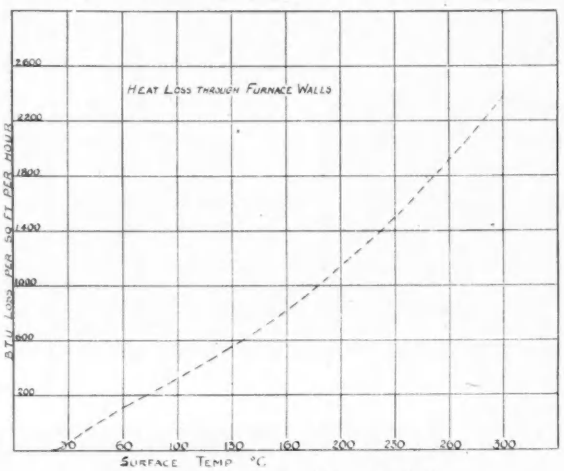


Chart of Losses through Furnace Walls.

this case a saving of something like 37,000 B.Th.U. per hour, or 15% of the heat input, can be effected by the application of suitable insulating material.

Most insulating materials depend for their heat-conserving value on the air contained in the numerous cells and cavities in the material itself, or upon similar air-holding cavities which arise from the manner in which the individual particles of the material are massed together. Any material which can hold in suspension air incapable of movement has some insulating value, though the smaller and more compact the air cavities and the greater the heat conserving value, provided there is no intercommunication between the minute pockets of air. Were it possible to build a cavity wall around a furnace with the cavity entirely sealed against egress or ingress of air, then, within certain limiting temperatures, an excellent insulation would result.

At temperatures approaching 1,000°C. the insulating value of the air in the cavities falls rapidly due to heat radiation across the cavities being approximately equal to the rate at which the heat is conducted through the material itself.

For general furnace work three forms of heat conserving material are in common use—(*a*) blanket or sectional coverings of asbestos, slag wool, and glass silk, (*b*) plastic coverings with a magnesium carbonate or oxide base, or diatomaceous matter and asbestos, (*c*) brickwork or powder of a diatomaceous nature.

Materials in class (*a*) can be used only as a covering to the outer surface of the structure and in positions where the surface temperature of the brickwork is not above 450°C. They afford the advantage of easy removal in case of alterations or rebuilding, and if protected by fine mesh netting can be depended upon for

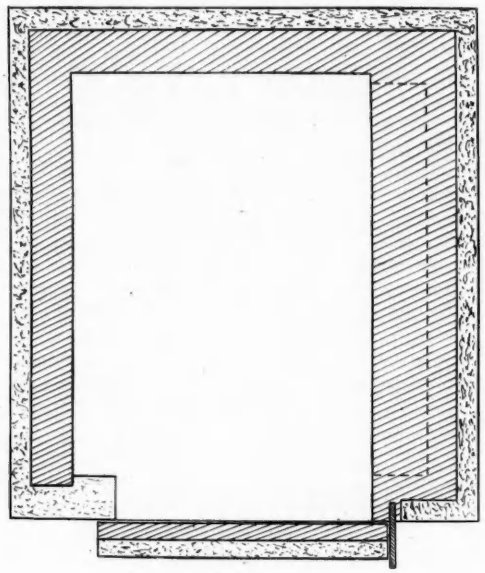


FIG. 1.

a reasonable service at low initial cost. At temperatures higher than that mentioned the fibres begin to disintegrate, and it becomes difficult to retain the material in position. Even with an outer metal jacket the material tends to fall to the bottom of the space between the brickwork and the jacket, leaving an open uninsulated section towards the top.

Class (*b*) materials are usually a mixture of 85% magnesium carbonate and asbestos fibre, or diatomacous earth and fibre, the latter being employed mainly as a binding agent. Magnesia base materials are limited in application to temperatures of approximately 300°C., and therefore need a protection between the hot brickwork and the insulation. Diatomaceous plastics, however, can be safely used to cover surfaces at a temperature of 800°C. Both these materials depend for their heat-conserving value on the minute air pockets in the material and not on the low conductivity of the mass. Extreme care is needed when applying plastic insulation to ensure that perfect contact is established throughout the surface to be covered. The material must be built up in thin layers, each being allowed to dry thoroughly before the next layer is applied, and additional strength being given to the covering by incorporating wire mesh in the final layer.

Tests recently taken on a conveyor type furnace in continuous operation, with an internal temperature of 1,270°C. and an external wall temperature of 173°C., show that this latter figure has been reduced to 49°C. by covering with a 2½ in. thickness of 85% magnesia plastic, with a corresponding reduction in fuel consumption.

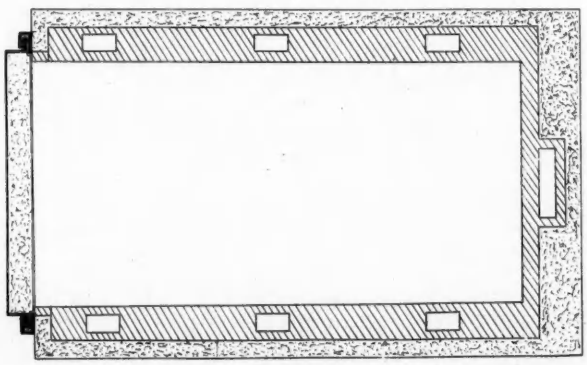


FIG. 2.

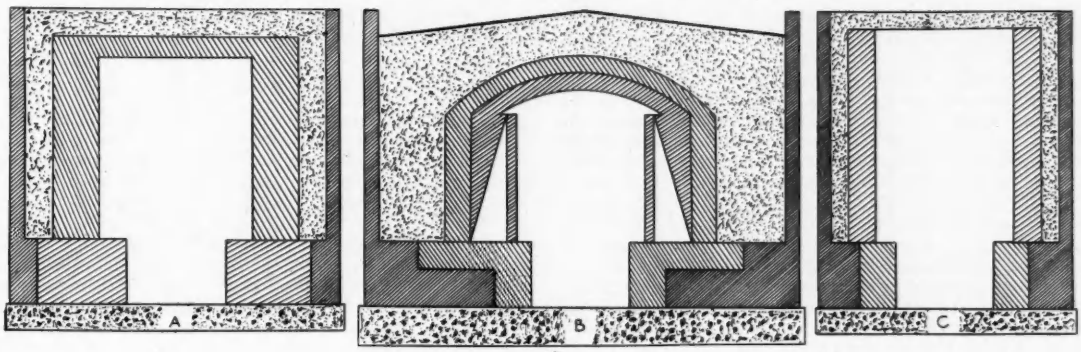


FIG. 3.

Taking 1,000°C. as an average internal temperature it is at once apparent that, unless an extraordinary thickness of refractory brickwork is provided, the temperature on the outer face of the furnace will be much higher than can be successfully dealt with by most of the insulating media already mentioned. Even with a 13 in. thickness of refractory—which on many furnaces is economically impossible—the outer surface will eventually reach a temperature of 275°C., giving a radiation loss of approximately 2,100 B.Th.U. per sq. ft. per hour as shown on the chart of losses through furnace walls. It is therefore imperative to provide a solid or semi-solid mass of material with a conductivity much below that of ordinary refractories.

The insulating properties of the materials in class (*c*), although used either in powder or solid form, are likewise dependent on the small air cells in the material. These cells vary from 60% to 90% of the volume of the material, and, since the cells are sealed, the heat conserving properties are retained to a considerable degree up to the temperature where conduction losses equal radiation losses across the cells.

When used in the powder form for filling cavity walls or covering the roof of a furnace it is essential that the powder be tamped down and made reasonably solid to get the best effect. In the case of roof insulation the powder should be covered with brickwork or a thin layer of plastic material to prevent disturbance of the powder by air currents or at times when it may be necessary to work on the roof of the furnace. As compared with the powder bricks afford many advantages. According to the maker and the type of work for which designed, insulating bricks weigh from one-eighth to one-fourth that of an equivalent volume of firebrick, and have a crushing strength in the region of 900 lb. per sq. inch. Here, then, is a twofold saving, heat loss being minimized and the weight of the structure considerably reduced, this latter detail being extremely important in the case of large continuous-type furnaces where foundations must be provided capable of withstanding a heavy load.

With the ordinary type diatomaceous insulating brick a protecting wall of firebrick is required on the inner surface of the furnace as the material will not usually stand up to a temperature above 850°C. without shrinkage, and consequently collapse of the structure might follow through failure to carry the load. Thermal conductivity varies with the makers, being from 0.84 to 1.64 at a temperature of 900°C.—*i.e.*, approximately one-sixth to one-twelfth that of a corresponding thickness of ordinary firebrick.

Fig. 1 shows in elevation a standard type furnace wherein insulation is provided around the whole structure, including the door, the insulation of the latter being protected by a lining of refractory. The roof, side and back walls carry 4½ in. insulation behind 9 in. of firebrick and the whole furnace, apart from the door and base, is covered with 12s gauge aluminium sheet. The floor, along which combustion takes place, varies from 9 in. to 18 in. in thickness due to flues and supporting brickwork for the hearth, and the base is formed from 4½ in. of insulating concrete. For a furnace with a maximum internal temperature of 1,100°C. insulating in the manner shown can be considered highly efficient and approximates to the ideal thickness which can economically be adopted.

The designer of the furnace shown in plan in fig. 2 does not appear to have correctly appreciated the principles of furnace construction and insulation in this particular instance. With side walls of 9 in. firebrick carrying openings of 4½ in. for combustion ports, only slightly more than 2 in. of brickwork is left between the flames and the insulation. At least 3 in. should have been allowed, preferably 4½ in., in order to ensure that the inner face of the insulation is kept below the safe limit of temperature. The door, likewise, should have been provided with a protecting face of firebrick—actually this has been done as the insulation deteriorated very considerably after a few days' firing. For some reason, the designer has seen fit to reduce the thickness of the refractories on the back wall to 4½ in. and to increase the insulation to a thicknes of 11 in., except around the rising flue, where it remains 4½ in. The additional thickness of insulation serves no real object other than to keep the shape of the furnace symmetrical.

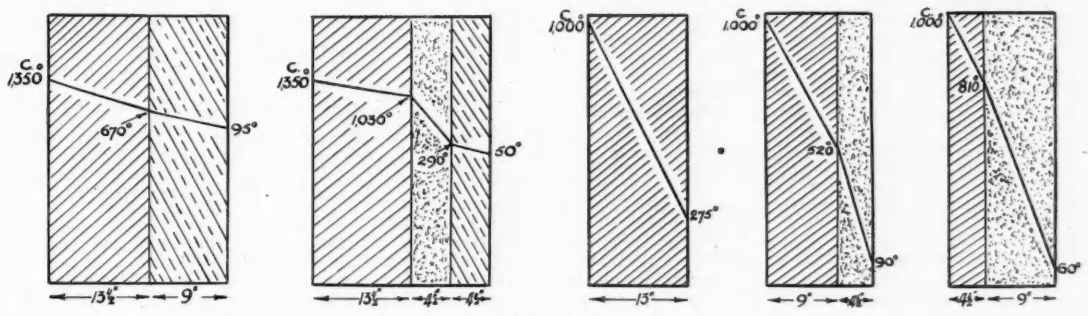


FIG. 4A.

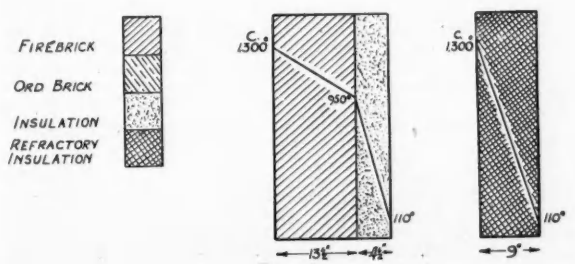


FIG. 4B.

Fig. 3 shows three sectional elevations of a continuous type furnace, A, pre-heating section, B, firing zone, and C, the cooling end. From the firing zone, where the temperature is 1,200°C.,

the heat current is directed towards the pre-heating section, and it is at once apparent that insulation has been applied with a view to retaining the maximum amount of heat in the places where it will serve the most useful purpose. One difficulty in insulating this type of furnace, particularly where it is essential to cool down the material after firing, is to reduce the temperature sufficiently in the cooling zone and yet prevent dispersal of excessive heat into the factory. As shown in c the insulation is only two-thirds the thickness of that in the pre-heating zone, and this applies only for a short distance from the firing zone, and is entirely dispensed with towards the exit, being replaced with thin panel bricks behind which the air for combustion is circulated.

The insulating material on the roof of the firing zone is protected by a thin covering of fireclay and powder applied at a consistency of thick cream after the furnace has worked for some time at maximum temperature. As ordinary insulating bricks are of a much softer texture than other bricks, they must be protected against abrasion and damage by a wall of common red brick, tiles, or sheet metal. Heat losses through the base of the structure are reduced to the lowest possible degree by the use of insulating concrete as a cover for the foundation. Where furnaces are built on "made ground," especially those with regenerators below the furnace, thorough insulation of the foundations and regenerators is necessary to prevent not only heat losses, but possible firing of the ground and consequent damage to the structure.

The development of refractory insulating bricks which will withstand temperatures between 1,300°C. and 1,400°C. and yet retain a low conductivity and high crushing strength is proving of immense benefit to furnace builders and users, as shown by fig. 4, giving details of heat losses through walls of varying construction and thickness. By the use of this type of brick the weight and bulk of heat-holding material is considerably cut down, heat is kept inside the furnace, temperature is more uniform, less time is required to raise the furnace to working temperature, and an appreciable saving in fuel can be effected. With the rising costs of fuel and the need to speed up output it is most important that all wastage should be eliminated. Insulation is now available in so many forms that there can be no excuse for the furnace user who does not take every advantage of the materials available.

Midland Counties Coke Association

THIRD ANNUAL GENERAL MEETING

THE Meeting, held in Birmingham on May 1, was well attended, some of those present being Mr. A. W. Smith, Chairman; Mr. F. C. Briggs, Chairman of the Executive Committee; and Messrs. C. M. D. Belton, A. H. Cranmer, and J. Mitchell, members of the Emergency Committee. Among others were Messrs. G. Dixon, A. Mackay, P. N. Langford, G. P. Mitchell, and A. Roberts.

The Chair was taken by Mr. A. W. SMITH, who, after opening the Meeting, outlined the coke position during 1940 and the part taken in it by the Association. He explained that, owing to wartime circumstances, some of the remarks he was about to make were for the ears of his listeners only. However, among other points were the following:

"The objects of the Association remain the same. That is to say, as far as we have been able within the limits of wartime restrictions, we have kept in mind the promotion of the use of coke; the co-ordination and regulation of its price; and the provision of technical services. To this, perhaps, should be added one other object which the Committee has kept before it since the outbreak of the war, and that is to enable the Association to be of the greatest possible service to all its members in connexion with Government regulations affecting the Industry, both before and after they are promulgated. I shall be touching on this later on when we come to speak of the National Federation of Gas Coke Associations.

"The Area of the Association remains the same, membership having been increased by one, and the tonnage produced for sale in 1940 was greater than in the previous year.

"Some of the most important of the Association's activities during the year must come under the heading of the National Federation of Gas Coke Associations. Though the preliminary spade work in connexion with the Midland area is done by our own Association, negotiations with the Mines Department in regard to coke are carried out on a national basis through the Federation, and there is no doubt it has proved an invaluable medium.

"The Chairman of the National Federation is Mr. R. W. Foot; Mr. Briggs and I are the representatives of this Association on the General Committee. Meetings are held regularly each month in London.

"Any negotiations concerning gas coke only are carried out between the Mines Department and the National Federation; when they concern hard coke as well as gas coke they are carried out by joint representation still under the auspices of the National Federation."

Mr. Smith went on to mention some of the important work performed by the National Federation, and the greater speed which attended negotiations with the Mines Department now than during the last war. Sometimes, however, the announcement by the Department of, say, a price increase, and the date upon which it was to come into operation, still left insufficient time to get the necessary machinery working.

He continued:

"Members have already been advised of one mark of the Mines Department's recognition of the importance of the Coke Associations; price increases are now authorized for Gas Coke Association areas, and not for geographical areas as previously. There is no doubt whatever that our dealings with the Mines Department carry much more weight coming from a nation-wide organization than from individual gas undertakings, or even individual Associations.

"During the year the Federation was requested by the Mines Department to prepare, in collaboration with hard coke and anthracite interests, pamphlets in connexion with a campaign to promote the more efficient use of solid smokeless fuels. A Joint Committee was set up to do this, and from it has arisen the idea of a permanent Joint Technical Committee between gas coke and hard coke producers which will discuss technical matters relating to both classes of fuel. Mr. T. F. E. Rhead, Chief Chemist of the Birmingham Gas Department, has consented to represent this Association on the Committee for the time being.

"Coming to the item of coke prices, you all know the position. If we may include Jan. 1, 1941, in the year we are reviewing, there were three general price increases authorized by the Mines Department, amounting to 5s. 10d. in all. All these increases were consequent upon advances either in the pithead price of coal or in freight charges, or both, in accordance with a formula which was agreed with the Mines Department. The increase of 2s. 6d. per ton on Nov. 1 was automatic, following an advance in coal prices, but the exact amounts of the other two increases had to be negotiated with the Mines Department.

"Since the beginning of the war coke prices in the Association's area have advanced by 8s. 4d. per ton, or, speaking of the 'delivered to premises' prices, by an amount up to 9s. 4d. per ton."

Mr. Smith then gave the Emergency Committee's considered views on the price position.

He continued: "We have managed to maintain monthly or bi-monthly meetings with hard coke producers, and have continued to find solutions to the various matters concerning both industries which have been brought up at these meetings. Neither side has hesitated to bring forward troublesome matters, which I am happy to say have always been amicably settled.

"During the year the Distributors' Branch has got into its stride. It now numbers some 1,800 firms, all of whom appear in a Register which has been printed and issued to all concerned. In March, 1940, a Distributors' Central Committee was set up, with Mr. A. E. Bond, of Messrs. J. C. Abbott & Co., Ltd., as Chairman. Three well attended meetings took place during the year. Distributors' County Committees have also been set up and are ready to function when required.

"The subject of factorage was very thoroughly thrashed out during the year both by the Distributors' Committee and by the Joint Committee, which is composed, of course, of representatives of gas coke producers, hard coke producers, and distributors. By the end of the year a provisional set of factorage rules had been worked out to cover the whole subject and the Factors' Roll was nearing completion. Names have only been included on this Roll after thorough consideration first by a Sub-Committee of Factors and then by the full Joint Committee. Our aim has been not to exclude any firms which are doing a legitimate factoring business, and at the same time to keep the Roll within limits.

"I am glad to say that we have maintained our friendly relationship with the Mines Department officials operating in this Area, and the Secretary of the Association has been able to act successfully as liaison officer in some cases between its members and Divisional Coal Officers or Local Fuel Overseers on matters of purely local concern.

"The Emergency Committee which was set up at the outbreak of the war has continued to function and has met frequently whenever circumstances have necessitated it—sometimes too frequently for those of us who have many other claims upon our time. We thought we were about to resume meetings of the Central Committee in the Spring, but shortly after the meeting in March, 1940, emergency conditions intensified and members did not feel able to leave their works during the critical summer months. Another Central Committee meeting was held in October last, which heralded a period of air raids, so that once again it seemed wiser not to call meetings unless they were essential.

"In common with most industries, coke had to face up to many difficulties during the year. On one hand we had an increasing demand, much of it for urgent priority business, and on the other hand we had difficulties in getting coal delivered to the works to make the coke; difficulties of reduced labour in producing and marketing it; and difficulties of transport in conveying it to its place of

consumption. In the Midlands, however, we did not have to face the acute shortage which resulted from these conditions in some other areas. I think there has been a good deal of 'helping out' between undertakings in the Midland Area, and so far we have not had to resort to the importation of coke from 'surplus' areas and the setting up of a pool system which this would require. No one can forecast the supply position in the coming year with any measure of accuracy; we can only hope that we can successfully meet whatever circumstances arise.

"Regarding the coke price position, I think we can feel a certain amount of satisfaction. It is recognized to be on a more orderly basis than that of any other solid fuel, and there is no doubt that this is entirely due to united effort. Once again we may congratulate ourselves upon the establishment of this Association and of the National Federation in time for them to answer the purposes for which they were designed—that is, service to the coke industry."

Mr. Smith then formally moved the adoption of the Report and Accounts.

Mr. F. C. BRIGGS (Chairman of the Executive Committee), in seconding their adoption, said that there were several facts upon which the Association might congratulate itself. One of these was the good fortune that the Association was in existence at a time when it was most needed, and the same could be said for the National Federation of Gas Coke Associations, which was an incalculable tower of strength. He mentioned the little troubles which had sometimes occurred in the Midland coke world prior to the formation of the Association, and which now happily seemed to have disappeared, and said that the strides which had been made were due to the loyalty of members.

The question of the resumption of Central Committee meetings was raised, and Mr. G. Dixon expressed his personal satisfaction with the way in which the Emergency Committee was looking after the interests of all concerned and dealing successfully with the many knotty problems which arose from time to time. He considered the Association was very much indebted to the Emergency Committee, and asked if they would continue to carry on as they had been doing and only call Central Committee meetings when necessary. The other members present signified their agreement with Mr. Dixon's views.

The proposal that the Report and Accounts should be formally adopted was then put to the meeting and carried unanimously.

A very interesting discussion followed on general matters relating to coke.

Mr. G. DIXON proposed a hearty vote of thanks to the Chairman, both for conducting the meeting that day and for all he had done for the Association during the year under review. Appreciation was also expressed for the work of Mr. F. C. Briggs, who shared Mr. Smith's responsibilities, to Messrs. C. F. Dakin and R. A. Dry (Price Advisers), and to the Secretary, Miss O. A. Price.

NORTH OF ENGLAND GAS MANAGERS' ASSOCIATION

Presidential Address

of

H. P. ALLISON, Redcar

ANNUAL MEETING
Newcastle-on-Tyne, May 2

MY official duties as President during the year have been particularly light, owing to the fact that it was not found possible to accept my Council's invitation to hold the half-yearly meeting of the Association at Redcar last autumn, but I sincerely hope that this unavoidable omission may be rectified at some future time. The present abnormal times are making ever-increasing demands upon our business and leisure hours, and render the preparation of a Presidential Address worthy of this Association a most difficult and onerous task, so that I must crave the indulgence of the members for the brevity of my remarks.

I find, upon looking through the list of past Presidents of our Association, that Redcar previously supplied a President in 1916, when the late Mark Fligg was elected to the office. Unfortunately he died during his period of office and therefore did not address the Association. It is the privilege of the President to decide what form his Address shall take, and in many cases a description of his works or distribution system is chosen. However, I do not propose to adopt this course owing to the limited material available, due to the fact that the Redcar Undertaking has received a supply of crude coke oven gas since the year 1927, with the exception of a period from August, 1931, until February, 1934, when the local coke ovens closed down owing to the lack of demand for coke caused by a general industrial depression. I have, therefore, decided to confine my remarks to topics affecting our Industry generally, although I fully appreciate that many items of considerable importance to gas administrators must be avoided at the moment.

The present War is responsible for an entirely new set of conditions for the Gas Industry. For instance, the variety of Orders and Regulations which it has been necessary to put into operation have so taken up the time of the gas engineer and the technical staffs that in the majority of undertakings time is not available for contemplating the course of action to be adopted when we return to conditions of peace. This is to be regretted, because I am convinced that it is vitally necessary that this matter should be fully considered in order to be ready to take advantage of experiences gained during the present unprecedented times, and also to be ready to enter 100% into the field of competitive business to ensure continued progress for the Industry.

The Great War, and After

I would now like to go back to the period of the Great War in order to mention some of the interesting features which have been introduced since then, and consider several points which, in my opinion, will require immediate attention in the postwar period.

The years 1914–1918 were a very difficult time for the Gas Industry, but were in addition years which brought many changes. The conditions under which gas undertakings were compelled to work, and the methods adopted to ensure an adequate supply of gas for consumers in general, made it abundantly clear that the time had arrived for more freedom of action being granted to the Industry. The case was referred to the Fuel Research Board, who after due consideration recommended that the system of charging for gas should be altered, and a scheme introduced whereby the charge was made in accordance with the thermal units supplied in the gas. This method was eventually accepted and later incorporated in the Gas Regulation Act, 1920, thereby granting much greater freedom of action in respect of the quality of gas supplied by the individual gas undertakings.

The Industry also suffered severely from a shortage of labour, and of certain classes of material which made the pursuit of more gaseous therms per ton of coal a matter of prime importance. The methods adopted to achieve this purpose, coupled with the freedom of action granted by the new legislation, have been reflected in the types of gas manufacturing plant erected since this period. In addition very considerable progress has been made in the design and efficiency of gas-consuming appliances.

The inauguration of the Education Scheme of The Institution of Gas Engineers during the period under review was undoubtedly an outstanding event, and one which has been of great benefit to those entering the Industry.

The granting of a Royal Charter to the Institution in 1929 was worthy recognition for the great work done by that body for the Gas Industry, and in addition gave the added status necessary to induce the best type of student to choose gas as a career.

The formation of the British Gas Federation in 1934 brought together the principal national gas organizations into one body, so forming a representative national organization for the Gas Industry.

In the year 1937 the publication of the final report by the Departmental Committee on Street Lighting was a feature of considerable interest to lighting authorities, by indicating the standard of street lighting desired in the interest of present-day traffic on the roads.

The placing on the Statute Book of the Gas Undertakings Acts of 1929, 1932, and 1934 conferred further powers and greater freedom of action on the Industry, particularly by allowing gas undertakers to sell gas by special contracts.

The general progress made by the Industry during the greater part of the period under review is shown by the Board of Trade Return for all authorized gas undertakings for the year 1937, which is the latest available information. Between the years 1920 and 1937 the sale of gas increased from 255,403 to 316,400 million cu.ft.; the number of consumers increased from 7,448,332 to 11,009,745, and the length of mains increased from 38,847 to 63,436 miles. The increase in the sale of gas is very gratifying,

being equivalent to 34.4% over the period. Unfortunately the position is not quite so satisfactory when compared on the basis of consumption per consumer, which dropped from 31,600 cu.ft. in 1920 to 28,700 cu.ft. in 1937, and further the consumption of gas per mile of main was reduced from 6,059,000 cu.ft. in 1920 to 4,987,000 cu.ft. in 1937.

There are contributory reasons for the last two reductions of which we are all well aware. However, improving the consumption per consumer is a matter that requires special effort.

Coal

I will now refer to some of the more important matters which appear to require serious consideration in connexion with an eventual return to normal conditions.

Coal, a very vital part of our great Industry, has during recent years received a great amount of attention from those in authority, involving very substantial increases in the price paid for it by its users in general. The portion of this increase which has been passed on to the men who endure many hardships in order to win the coal has, in my opinion, been willingly paid. The balance of the increased price which has had to be paid in many cases for inferior classes of coal is not so easily justified; it has definitely had an adverse effect on the finances of gas undertakings, and has necessitated increases in the price of gas. When the present emergency is over we should make every possible effort to regain our former freedom of action in the choice of coal bought, in order to obtain the type most suitable for the needs of a particular undertaking, and further a return to the competitive method of business on the basis of analysis. The Gas Industry in common with the coking industry is making a substantial contribution towards the conservation of coal, which is a matter of national importance. Each ton of coal which is processed at a coking plant or gas-works produces more heat units than an equal amount used in the raw state, and in addition releases the very valuable by-products which would otherwise be lost. These two facts should, in my opinion, be of sufficient importance to enable the two industries to receive every assistance and more freedom in the choice of coal required, as they are definitely the sole approach to a satisfactory solution of the problem of coal conservation.

Gas for Industrial Use

Gas as an industrial fuel was only in its infancy during the period of the last war, but to-day many millions of cubic feet are used in various industries. The large increase in this particular sphere is in a great measure due to the very valuable research work performed by the Industrial Gas Development Centres throughout the country, whose efforts have done so much to popularize the use of gas for industrial heat treatment. A large proportion of the present industrial demand is being used in connexion with munition work of various types, and as such will in all probability cease when the present emergency is passed, but the obvious benefits accruing from the use of gas as a fuel should be of great assistance in maintaining a fair share of peacetime business for gas. The memory of the public is, however, short, so that the service rendered by the Industry during the emergency cannot be accepted as a safeguard for the future. It will, therefore, be necessary to continue our research in an endeavour to develop new methods and new equipment, giving still greater efficiencies in use, in order to retain as large a share as possible of the various industrial heat treatment loads for gas.

Research

This is a subject which has engaged the attention of the Industry for many years, and much valuable work has been accomplished by the Joint Research Committee of The Institution of Gas Engineers in conjunction with the University of Leeds, together with the individual efforts of the larger gas undertakings, but I think it will be agreed that a progressive step has now been taken in the establishment of a Gas Research Board, and the proposed appointment of a whole-time Director of Research to be responsible for co-operative research in the Industry. It is to be regretted that so soon after the formation of the Board its activities should be restricted by the outbreak of war. The need for organized research in Industry has never been greater than at the present time. It is, therefore, very gratifying to know that our own Industry is prepared to deal with the problems which will confront us in the post-war years, for it is only by the development of more efficient methods of manufacture and utilization that we can hope to continue making progress in the sale of gas.

Gas-Consuming Appliances

The progress made in recent years in the design and finish of gas-consuming appliances has been of material advantage to gas undertakings by stimulating interest in the latest and most efficient types, thereby assisting greatly in the retention of the domestic load; but it must be remembered that the use of the more efficient appliances has been partly responsible for the reduction in the consumption of gas per consumer, so that it is in the interest of all gas undertakings that consumers should be encouraged to use additional appliances. In connexion with my own efforts in this direction I have come up against a difficulty which has in many cases prevented actual business being accomplished after the consumer has become definitely interested in a particular piece of apparatus, due to the fact that it would be necessary to take up floorboards in order to install gas pipes. I refer chiefly to houses in newly developed areas where speculative building has been done at competitive prices, and where the only gas pipes installed were for a cooker and wash boiler. A large amount of effort has been expended to persuade builders of the desirability of putting in gas pipes to the fireplaces when building the house, and certain inducements have been offered, but with one or two exceptions it has been of no avail. I would, therefore, suggest that a national effort be made to contact architects and builders, and if necessary the Ministry of Public Works and Buildings, before the plans are made for the tremendous amount of reconstruction which will be necessary after the war to provide additional homes, so that in all future houses the prospective householder may have the choice of the fuel he desires to use, without the trouble of disturbing the house to instal pipes after completion.

Showrooms

The development of up-to-date showrooms is a subject which has received a great deal of attention by the Gas Industry during recent years, and much valuable publicity has been gained by this means. The showroom windows, provided they are situated in a prominent position, are a very valuable asset to any gas undertaking, and are worthy of concentrated effort being made by way of display. There is, however, one point where, in my opinion, improvement could be made, and that is in the standardizing of prices of the various appliances over an area. In normal times, when people are more free to travel, gas appliance prices are frequently compared in the different showrooms. These variations in prices between one gas undertaking and another do certainly leave a certain amount of doubt in a consumer's mind, and are difficult to explain satisfactorily. I appreciate that an effort has previously been made in the North of England district to standardize prices, but the subject is worthy of further consideration in the hope of arriving at a satisfactory basis of charge suitable for all undertakings, thereby removing price anomalies.

Manufacturing Plant and Distribution System

The experience gained by many gas undertakings, particularly those in the more vulnerable areas, will be of exceptional value in providing a basis for considering post-war planning as affecting works and distribution systems. The dependency of so many industrial and domestic consumers on a constant supply of gas in periods of peace or war makes it absolutely essential that every consideration for safeguarding our plants and distribution systems be undertaken in all future planning. I fully appreciate that this is an immense subject requiring much careful investigation, which can only be undertaken after carefully tabulating the experiences gained during the present emergency. In my opinion it is a matter for serious consideration by the National Gas Organizations.

In conclusion, I desire to express my sincere thanks to the Mayor and Corporation of Redcar and the Chairman of the Gas Committee for their kindness in granting facilities for the holding of our half-yearly meeting at Redcar, which unfortunately, through force of circumstances, it was not possible to accept.

Of All the Exhibitions in the Borough during War Weapons Week none attracted more interest than a naval display in the Barnstaple Gas Company's Cross Street Showrooms. Under the initiative of Mr. J. H. Lowther, Engineer and Managing Director, the whole of the showroom space was devoted to a display that ranged from an actual plate from H.M.S. "Vindictive" to a periscope from a German submarine. Shells of various calibre were shown, as well as a full diving suit, complete with manual pumps and lifelines. A naval petty officer was in charge, and his kindly courtesy in response to a spate of questions was noteworthy.

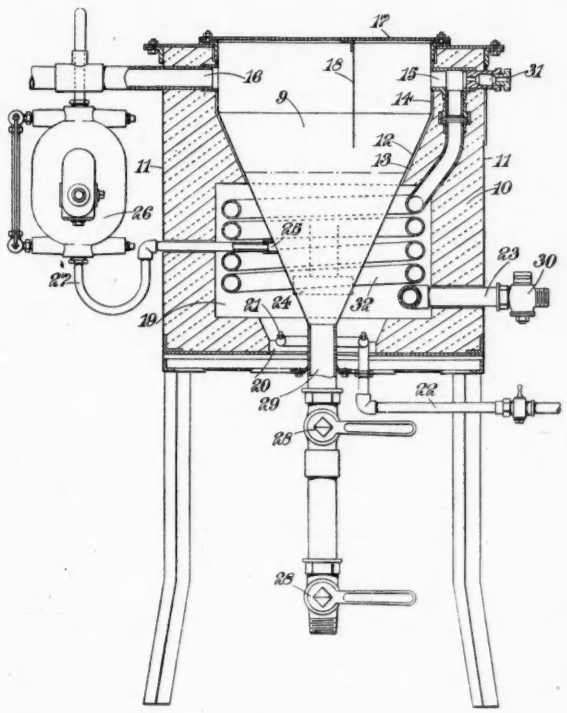
PATENTS

Electrical Precipitation Plant

Electrical precipitation plant is the subject of a patent (No. 534,932; application date, Aug. 14, 1939) taken out by the Gas Light & Coke Company and G. Dougill. It is for purifying gas, manufactured by carbonizing or otherwise gasifying carbonaceous material, such as producer gas, in which plant the suspended particles are removed from the gas by passing it through an intense electrostatic field. In plant of this type the particles are caused to settle on the electrodes, from which they may be removed by vibration or by washing. It has been found, however, that the deposited particles are difficult to remove by known means, such as mechanical scrapers, or washing, and grow as stalactites on the electrodes, and after a short time—for example, two days—allow such excessive current to pass that the voltage cannot be maintained upon the electrode and the plant fails.

The suspended impurities in producer gas consist of very fine ash, fumes, such as sodium chloride and zinc compound, and pitchy matter varying from sticky tar to hard pitch carbon. It appears that each of the suspended particles usually contains all or most of these substances, and it is therefore not possible fractionally to precipitate the various substances and deal with each by any suitable washing method.

According to the invention, a method of electrically purifying gas,



manufactured by carbonizing or otherwise gasifying carbonaceous material, such as producer gas, consists in adding to the gas a vapour and/or fog of a treating material such as tar oil, or other aromatic oil, having the property that it will combine with the suspended particles chemically or physically, as by emulsification or by partially dissolving them, and passing the mixture through an electrostatic field between electrodes. This treatment of the gas results in the particles being deposited on the electrodes in a readily removable form—for example, in a form in which it either flows from the electrode or may be removed by simple means, such as washing.

The oil may be either atomized directly into the gas or evaporated into a small proportion of the gas heated to a suitable temperature and then added to the main gas stream. The tar oil must be sufficiently volatile to be readily vaporized into the gas or suitable to be atomized into the gas stream. Excess volatility is a disadvantage, since a large proportion would remain as true vapour and so would not be electrically precipitated with the impurities. Further, the said oil must be sufficiently fluid that the final mixture with the impurities will flow from the electrodes and plates, or if it reacts with the impurities the resultant product must be either fluid or capable of being readily washed from the plates and electrodes. It is essential, of course, that the added substance must not interfere with the electrical insulation of the plant. When the fog is formed by vaporization into a stream of heated carrier gas, a substantial proportion of the oil is present as true vapour, and when this is cooled by entry into the main gas stream it is a great advantage that this vapour utilizes the particles of impurity as nuclei on which to condense, and so brings the added oil into very intimate contact with these impurities. The stream of carrier gas should preferably be drawn from the purified gas at the outlet of the electrical precipitation.

In treating producer gas, a gallon of tar oil per hour is vaporized into 600 cu.ft. of heated producer gas which is continuously introduced into one million cu.ft. of gas which flows through the precipitation plant per hour. When a tar oil is employed, which boils between 200° and 400°C. a suitable temperature for vaporization is 280°C.

An apparatus for carrying out the process may comprise a vaporizing chamber, means for feeding the material to be vaporized on to a vaporizing surface which extends downwardly from the upper part of the chamber, means for heating the surface, means for introducing the gas into the chamber so as to flow over the vaporizing surface, and means at the upper part of the chamber for withdrawing the gas mixed with the vaporized material, means for creating an intense electric field between electrodes, and means for conducting the gas mixed with vaporized material through the electric field. Preferably, the gas is heated prior to its receiving the vaporized material.

The following is a description of one form of apparatus for introducing a fog of oil into producer gas, reference being made to the accompanying drawing, which shows a vertical section through the apparatus. The apparatus comprises a vaporizing chamber 9, the wall 10 of which is formed from refractory insulating brickwork surrounded by a mild steel casing 11. A vaporizing surface is provided by the internal surface of an inverted cone 12 formed from mild steel sheet which is supported on a conical seating 13 formed by the aforesaid brickwork. The upper part of the cone is provided with a cylindrical extension 14 with which is associated an inlet pipe 15 and an outlet pipe 16 for the producer gas. The cylindrical extension is closed at its upper end by a removable cover 17 to which is secured a downwardly extending baffle plate 18, which is arranged to one side of the centre of the chamber nearer the inlet pipe than the outlet pipe. The lower part of the inverted cone projects into a combustion space 19 which communicates with an opening 20 in the lower part of the chamber. Located within the opening is a gas ring burner 21 which is fed with gas from a supply pipe 22. The gas ring is arranged to heat the walls of the cone and also to heat a coiled pipe 32 through which gas is fed from a gas supply conduit 23 to the inlet pipe 15. The combustion chamber is provided with a flue 24. The oil to be vaporized is fed to an inlet port 25 in the wall of the cone by means of an automatic feeder 26 having an outlet pipe 27 which communicates with the aforesaid inlet port 25. A drainage pipe 29 is connected with the apex of the cone through which unvaporized constituents of the oil may be withdrawn through the control cocks 28. The rate of flow of the gas may be controlled by a control cock 30 and its temperature determined by a thermometer which is held in a socket 31.

Toluene Production

The Gas Light & Coke Company and R. H. Griffith have been granted a patent (No. 534,648; application date, May 1, 1939) for the production of toluene. It relates more particularly to the recovery of toluene from coal gas manufactured in a continuous vertical retort installation.

It has previously been proposed in specification No. 293,906 to dehydrogenate a hydro-aromatic hydrocarbon by heating it—*e.g.*, at a temperature between 450° C. and 600° C.—alone or together with hydrogen or gases containing hydrogen in the presence of a dehydrogenating catalyst consisting of oxides of the metals of the sixth group of the periodic classification in admixture with each other or with oxides of the elements of the third and fourth groups. It has also been proposed in specification No. 464,957 to use a catalyst essentially consisting of or containing substantial amounts of oxides of aluminium and chromium in the dehydrogenation of hydrocarbons.

It has now been found that the conversion can be carried out much more satisfactorily by using a catalyst containing chromium and a promoter for the chromium catalyst in a specific range of ratios, the promoter being selected from the group hereinafter mentioned. The promoted chromium catalyst has been found to be particularly active in the conversion of hydro-derivatives of toluene to toluene and has the additional advantage that its use reduces the loss of material caused by undesirable side reactions.

Accordingly, the process of the present invention for the production of toluene from its hydro-derivatives consists in bringing the latter at an elevated temperature and at ordinary atmospheric pressure into contact with a catalyst containing chromium and a promoter for the chromium catalyst as hereinafter mentioned, the ratio of promoter to catalyst being within the peak-ratio range of the catalyst activity curve as hereinafter refined. The process may be carried out with advantage at a temperature in the region of 500°C.—*e.g.*, at a tempera ture between 450° and 550°C.)—and at ordinary atmospheric pressure and under these conditions the mixture is substantially completely converted into toluene.

In a prior British Specification No. 349,444 there is described a process for the dehydrogenation, polymerization, or condensation of hydrocarbons with the aid of a catalyst and a promoter, the ratio of

promoter to catalyst being within the peak ratio range of a curve on which the catalyst activity is plotted against the percentage of promoter expressed as the number of atoms of promoter element per one hundred atoms of catalyst element. The peak ratio range depends upon the particular catalyst-promoter combination in question and is the range of ratios which extends between the two points one on either side of the apex point of the peak at which the activity value is about 75% of that at the apex point. The term "peak ratio range of the catalyst activity curve" as used in the present specification and claims bears the meaning assigned to that term in the prior Specification No. 349,444.

The promoter for the chromium catalyst employed in this invention consists of one or more of the following elements: magnesium, zinc, cadmium, boron, aluminium, titanium, zirconium, cerium, thorium, tin, molybdenum, tungsten, uranium, or manganese, and may conveniently be employed in the form of an oxide or hydroxide of the element.

A chromium catalyst containing boron in an atomic ratio of boron to chromium of 18 : 100 or aluminium in an atomic ratio of aluminium to chromium of 20 : 100 has been found very effective in converting the hydro-derivatives of toluene to toluene.

The invention has been found to be particularly useful in the recovery of toluene from coal gas manufactured in a continuous vertical retort installation.

Toluene is generally obtained from coal gas by distillation from the crude benzole extracted from coal gas. It has been found, however, that the toluene fraction obtained from crude benzole recovered from continuous vertical retort coal gas is unsuitable for use in certain chemical processes—for example, in the manufacture of trinitrotoluene—and that this is due to the presence of di- tetra- and hexahydro-derivatives of toluene. These derivatives have boiling points very close to that of toluene and hence are very difficult to separate from toluene by distillation.

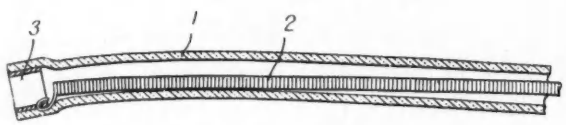
Example

A toluene fraction obtained from the carbonization of coal in vertical retorts which has a density of 0.814 and contains approximately 50% of hydro-derivatives of toluene was led over a chromium oxide/alumina catalyst at 475°C. at such a rate that three volumes of catalyst space treated one volume of liquid toluene fraction per hour. The liquid product condensed after this treatment had a density of 0.86 and consisted largely of pure toluene and the gas which was formed was found to contain over 90% by volume of hydrogen. The catalyst used was obtained by adding ammonia to a solution containing chromium nitrate and aluminium nitrate in such proportions that the mixed hydroxides produced consisted of 20 atoms of aluminium with every 100 atoms of chromium. The precipitate of hydroxides was washed, dried, made into pellets and then reduced in a stream of hydrogen at 475°C.–500°C.

It will be seen that the invention provides a method of obtaining a high yield of substantially pure toluene from continuous vertical retort coal gas.

Non-Kink Rubber Tubes

The South Metropolitan Gas Company and A. J. Prestage have taken out a patent (No. 534,263; application date Jan. 23, 1940) aimed at preventing the bending or compressing of rubber tubes from blocking the passage through the tube. The invention consists in a rubber tube having within it a helical wire spring of diameter substantially less than the internal diameter of the tube and attached at one or both of its ends to a device which is adapted to be pushed into the tube and which, while not blocking the passage through the tube, is held at any desired point therein by the walls thereof. The device may advantageously be a collar of which the external diameter is greater than the normal internal diameter of the tube.



The spring used in the invention, state the patentees, not only prevents kinking of the tube, but also imparts resilience thereto, and, being of small diameter, will withstand heavy loads without crushing. It is, they add, cheap to produce and is easily and firmly fixed in any desired length of tubing by means of the aforesaid devices.

The invention is illustrated by way of example by the accompanying drawing. 1 denotes a length of rubber tubing in section and 2 denotes the helical wire spring. The spring 2 is attached at both ends, as shown in the case of the left-hand end of the spring, to brass collar 3 of external diameter greater than the normal internal diameter of the tube. In the drawing the collar 3 is shown as held at the extreme end of the tube, but it may be pushed into any desired position, for instance so as to leave the end portion of tubing free for attachment to a gas tap.

Cooker Lids and Doors

A patent (No. 533,921; application date, Aug. 21, 1939) for improvements in check devices for hinged lids and doors arranged to limit the extent of their opening movement has been taken out by R. & A. Main, Ltd., and R. Taylor. It is particularly directed to hinged doors of ovens or refrigerators which are likely to remain in one position and, when in that position, the doors may require to be prevented from coming into contact with other objects in the room or with an adjacent wall.

According to the invention, a check device for a hinged door or lid of an article comprises a bar or the like pivotally connected to the door or lid at a distance away from the hinge axis, which bar is arranged to extend through a slot so formed in the doorway frame of the article as to lie opposite the pivotal connexion when the door is closed and means causing the bar to jam in the slot at a predetermined door opening. For example, the relative widths of the slot and bar in a direction transverse to the hinge axis may be so selected that the sides of the bar jam against the edges of the slot after a predetermined movement of the door.

Alternatively, or additionally, the bar may be provided at that end which lies within the doorway frame with a projection which is arranged to engage the face of the doorway frame flanking the slot.

Where it is required that the extent of movement shall be adjustable, means may be provided for adjusting the effective length of the slot. Alternatively, the projection may be adjustable along the length of the bar. For example, it may comprise a peg which may be brought into engagement with any of a number of holes along the length of the bar.

The invention is particularly applicable to oven doors which are usually provided with a cast-iron doorway frame and a cast-iron door frame. In such a case, the slot may be formed in the bottom member of the doorway frame and a steel bar is pivoted to a lug cast on the doorway, which bar is arranged to extend through said slot.

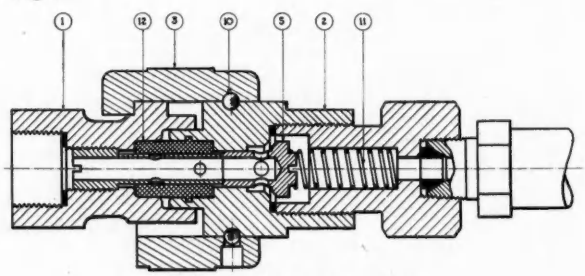
The means for adjusting the effective length of the slot may comprise a plate arranged at one end of the slot and secured to the doorway frame by a set screw which passes through a further slot extending partly along the length of the plate; by these means the end of the plate may be arranged to overlap the slot in the frame to a required extent. The underside of the plate may be provided with teeth extending transversely to its length which are arranged to engage similar teeth on the frame.

An alternative method of varying the effective length of the slot is to provide a set screw which engages a threaded bore in a boss formed on an inside face of the doorway frame, the axis of which bore is inclined to said face of the frame so that the head of the set screw may be adjusted towards and away from one edge of the bar which projects through the slot. The set screw is preferably provided with a lock nut.

High-Pressure Hose Coupling

Following the manufacture for many years of a simple hosepipe connexion for pneumatic services at normal pressures up to about 100 lb. per sq. in., Belliss & Morcom, Ltd., have introduced a ¼-in. bore coupling designed on similar lines for air or gas pressures up to 6,000 lb. per sq. in. As for the lower pressure design, the coupling is easily secured and unfixed by manual rotation of one half through an angle of 60 degrees.

Incorporated in the bore is a non-return valve closed by a spring on disconnecting the coupling and automatically preventing loss of pressure or escape of gas. The accompanying diagram details the design.



High-pressure Connexion Hose.

(1) and (2) are hollow main members adapted to be secured to the parts of a pipe or other parts to be connected. In (2) is arranged a poppet-type valve (5) which is loaded with a spring (11) tending to hold the valve (5) on its seating. The outer end of this member is made in the form of a rotatable collar (3) which is held in position on (2) by a ring of balls (10) and the outer end of the collar is formed with claws which can engage with complementary claws on (1). In the bore of (2) is arranged a rubber bush (12), which is coaxial with the bore. Projecting from the outer end of (1) is arranged a hollow thrust piece which opens the poppet valve (5) when the two halves of the coupling are brought together.

To make the coupling secure, all that is necessary is to engage one half with the other, compressing the bush (12) endwise, and then rotating the collar (3), thereby causing the claws of the collar to pass behind and snap into engagement with the claws of (1).

Gas Products Prices

The London Market

May 12.

There is little alteration to report in the values of tar products in the London market. Prices to-day are as follows: Pitch is nominal; creosote is 4¾d. to 5d.; refined tar 3¾d. to 4d.; pure toluene under the Ministry of Supply Toluene No. 2 Order is 2s. 5d.; pure benzole is 1s. 10d.; 95/160 solvent naphtha, 2s. 5d. to 2s. 8d.; and 90/160 pyridine, 13s. 6d.; all per gallon naked; refined crystal naphthalene is £23 per ton in bags; all prices are *ex* Makers' Works.

The Provinces

May 12.

The average prices of gas-works products during the week were: Pitch and Crude Tar,* Toluole, naked, North, 1s. 10d. (controlled by the Control of Toluene No. 2 Order, July 5, which fixes the maximum price at which this material may be sold). Coal tar, crude naphtha, in bulk, North, 10d. to 11d. Solvent naphtha, naked, North, 1s. 9d. to 1s. 10d. Heavy naphtha North, 1s. 6d. to 1s. 7½d. Creosote, *ex* works, in bulk, North, liquid and salty, 4½d. to 4¾d.; Scotland, 4½d. to 4¾d.; low gravity, 4½d. to 4¾d. Fuel Grade, 4d. to 4¼d. Carbolic acid, 60's, 3s. 7½d. to 3s. 9d. Naphthalene, £12 to £15. Salts, 70s. to 80s., bags included. Anthracene, "A" quality, 4½d. to 4¾d. per minimum 40% purely nominal. Heavy oil: Unfiltered anthracene oil (min. gr. 1,080), 5¼d. to 5½d.; filtered heavy oil (min. gr. 1,080), 5¾d. to 6d.; heavy anthracene oil gr. less than 1,080, 6d. to 6¼d.

* In regard to pitch and crude tar prices we would ask readers to refer to the editorial note in our issue of Sept. 4, 1940, p. 404.

Tar Products in Scotland

GLASGOW, May 10.

Throughput has been maintained without interruption and prices generally are well maintained.

Refined tar is available in substantial quantities at 4½d. to 4¾d. per gallon in the home market and 3¼d. to 3½d. per gallon for export, both f.o.r. naked.

Creosote oil: Ordinary quality is quite plentiful and prices are steady as follows: Specification oil, 5d. to 5¼d. per gallon; low gravity, 6d. to 6¼d. per gallon; neutral oil, 5¾d. to 6d. per gallon; all *ex* Works in bulk.

Cresylic acid is still in strong demand, particularly for export, at the following prices: Pale, 99/100%, 2s. 10d. to 3s. per gallon; Pale, 97/99%, 2s. 6d. to 2s. 9d. per gallon; Dark, 97/99%, 2s. 3d. to 2s. 6d. per gallon; all *ex* Works in buyers' packages.

Crude naphtha is maintained at 6½d. to 7½d. per gallon *ex* Works in bulk, according to quality.

Solvent naphtha: 90/160 grade is 1s. 8½d. to 1s. 9d. per gallon, and 90/190 Heavy Naphtha is 1s. 4½d. to 1s. 5½d. per gallon.

Pyridines are weak with value probably round 14s. per gallon for 90/160 grade and 16s. per gallon for 90/140 grade.

Gas Company Dividend

The Directors of Associated Gas and Water Undertakings, Ltd., are recommending a final dividend of 2½% on the Ordinary Shares, making 5% for the year ended March 31 last, which is the same as for the preceding twelve months. During the year the Company acquired from the Taunton and District Gas Company its share holding in the Langport, Huish, and Curry Rivel Gas Company, Ltd., which thus becomes a direct Subsidiary.

Gas Stocks and Shares

Markets generally opened quietly last week, but a rising tendency set in later, the gilt-edged section being particularly strong—2½% Consols closed ½ higher at the close. Home rails were also brighter, though the latest wages claims were inclined to check any marked upward tendency. More interest was shown in Industrials although where rises in prices occurred these were occasioned more to shortage of supplies than to increased demand. Rubber and tea shares still remained neglected, but a few moderate gains took place among oil and goldmining shares.

There were more transactions than usual in the Gas Market although, with few exceptions, the majority of these were probably forced sales with here and there some purchases for "lock-ups." Quotations on the whole remained steady, but the general downward tendency still persists. South Metropolitan lost another point at 34½, and Wandsworth dropped 3 to 60½. On the Provincial Exchanges Sheffield also eased a point to 109.

The following prices changes occurred during the week:

OFFICIAL LIST

Alliance & Dublin	88—93	−5
Associated Gas & Water Ord. (*x.d.*) ...	11/6—13/6	May 5
,, 4½ p.c. Red. Pref. (*x.d.*) ...	14/—16/−	,,
,, 4 p.c. Red. Pref. (*x.d.*) ...	14/− 16/−	,,
,, 4 p.c. Pref. (*x.d.*)	9/6—11/6	,,
Colombo, 7 p.c. Pref. (*x.d.*) ...	18/6—19/6	,,
Gas Light, 4 p.c. Pref.	50—60	−2½
,, 3¾ p.c. Red. Pref.	60—70	−1½
,, 3 p.c. Deb.	64—69	−1
,, 5 p.c. Deb.	103—108	+1
Montevideo, (*x.d.*)	53—58	May 5
South Metropolitan Ord.	32—37	−1
Tottenham, 5 p.c. Pref.	78—83	−2
Wandsworth Ord.	58—63	−3

PROVINCIAL EXCHANGES

Bristol, 5 p.c. Deb.	109—112	+2
Newcastle, 4 p.c. Pref.	80—82	+1
,, 5 p.c. Deb. '43 (*x.d.*) ...	97—102	Apl. 28
Sheffield Cons.	108—110	−1

A.R.P.

PROTECTION OF SANDBAGS.

METRO CREOSOTE EMULSION

METRO COPPER CREOSOTE EMULSION

Both Emulsions conform to the Specification of the Ministry of Home Security Memorandum A.R.P. 279/1939 — 20/10/39, and are available in GREEN at slight additional cost.

SOUTH METROPOLITAN GAS CO.

Products Department:

REGIS HOUSE,
KING WILLIAM STREET,
E.C.4.

Telephone: AVENUE 2755.

En passant

Cowards die many times before their deaths ;
The valiant never taste of death but once.
Shakespeare (Julius Cæsar).

ALDER & MACKAY LTD.

EDINBURGH · LONDON · BRADFORD · BRANCHES

Number Eight.

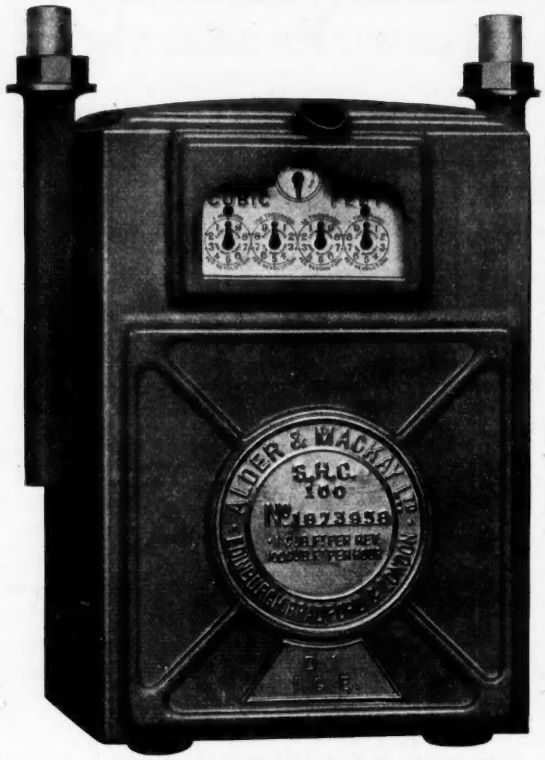


Illustration shows IGE "DI" Small High Capacity Meter. These meters are confidently recommended for demands up to the badge capacity.

"WASK" HIGH TENSILE MALLEABLE PIPE FITTINGS

OVER 4000 SIZES
INDIVIDUALLY AIR TESTED
STANDARD TAPER THREADS
FULL THICKNESS THROUGHOUT

Fit and forget!

MADE BY THE MAKERS OF—
"Wask" Up and Down Patent Lamp Suspenders, the NON-DISCONNECTING raising and lowering gear.

WALTER SLINGSBY & CO., LTD.
NEW DAM WORKS · · · KEIGHLEY
'Phone : Keighley 3749 (2 lines). Grams: Malleable Keighley

COMPRESSORS & EXHAUSTERS FOR AIR AND GAS.
See our Advertisement Next Week.
REAVELL & CO. LTD. IPSWICH.

CASES FOR BINDING
QUARTERLY
VOLUMES OF THE "JOURNAL."
Walter King, Ltd., "Gas Journal" Offices, 51, High Street, Esher, Surrey.

60% Sulphur absorbed by our
OXIDE
which has stood the test of 60 years
Minimum Costs, Highest Efficiency
ESTABLISHED 1873
GAS PURIFICATION & CHEMICAL COMPANY LIMITED
PALMERSTON HOUSE, 34, OLD BROAD STREET LONDON, E.C.2.
Telegrams: "Purification, Stock London." Telephone: London Wall 5077

STRACHAN & HENSHAW LTD.
BRISTOL.
MANUFACTURERS and CONTRACTORS for
HANDLING PLANT
SCREENS, TIPPLERS, ETC.

PLANT, &c.

FIRTH BLAKELEY, SONS, & CO., LTD.,
Vulcan Ironworks, Church Fenton, Tadcaster, Yorks.,
MANUFACTURERS of Gas-holders, Tanks, Condensers, Purifiers, Scrubbers, Washers, and every description of Gas Plant.
Sole Makers of the "P.M" semi-water Gas Plant.
Telegrams: "Blakeleys, Church Fenton."
Telephone: Barkston Ash 234 and 235 (Private Branch Exchange). Code: "Bentleys."

ROBERT DEMPSTER & SONS, LTD., ELLAND, Builders of CARBONIZING PLANTS, both Horizontal and Vertical. Manufacturers of CONDENSERS, PURIFIERS, GAS-HOLDERS, &c., also every description of COAL and COKE HANDLING PLANT. *Telegrams:* "Dempster, Elland." *Telephone:* Elland 2241, 2242 and 2243.

"KLEENOFF"
—THE COOKER CLEANER
Tins for Sale to Consumers. In Bulk for Works Use.
OXIDE OF IRON.
SPENT OXIDE BOUGHT.
BALE & CHURCH, LTD.
33, ST. MARY AT HILL, LONDON, E.C.3.
Telephone: Mansion House 1156. *Telegrams:* "Balefire, London."

Tufnol complies generally with British Standard Specifications and is in constant use by [illegible] ments their Tufnol consists is a insulating horn [illegible] and is not affected by oil, petrol, most acids and alkalies nor is it affected by climatic conditions. Its weight is [illegible] and [illegible] ages per to [illegible] ts, and [illegible] can be sawn, drilled, screwed, punched or otherwise machined like metal.